

the whale, though they do not seem required for the support and movements of that undivided and inflexible paddle.* The whole skeleton, skull, back bone, ribs, and limbs, are thus reduced to a unity in a series of segments repeated in their essential parts, though infinitely diversified to suit the purposes of the member.

Similar homologies are being detected in the invertebrate class of animals. The bodies of crabs and insects are made up of a series of rings with appendages, both of which are formed after a common plan, though modified to suit special purposes. In star fishes and sea urchins, the five-fold division of parts is commonly very obvious. These typical forms appear not only throughout the whole existing series of animals from the highest to the lowest, but throughout the whole geological series, from the earliest to the latest. The typical number of toes may be seen in the footprints of reptiles left on the rocks of very old formations. Buckland tells us that in the "fore-paddle of the plesiosaurus we have all the essential parts of the fore-leg of a quadruped, and even of a human arm; first the scapula, next the humerus, then the radius and ulna succeeded by the bones of the carpus and metacarpus, and these followed by five finger-phalanges. The hind-paddle also offers precisely the same analogies to the leg and foot of the mammalia; the pelvis and femur are succeeded by a tibia and fibula, which articulate with the bones of the tarsus, and metatarsus followed by the numerous phalanges of the long toes."

There seem to run through both the animal and vegetable kingdoms, not one, but two principles; the principle of order, and the principle of special adaptation. That every part of the plant and animal is suited to the functions and sphere of life of

* Lecture on Limbs by R. Owen, F.R.S. This original and learned anatomist thinks he has discovered a harmony in the structure of animals such as could not proceed from a mere regard to final cause. We are prepared to admit the truth and importance of this remark, provided it be understood as relating merely to final causes having a reference to the wellbeing of the animal. We can discover a very obvious final cause of these homologous structures in the circumstance that they are impossibly intelligible to arrange and group the works of God. How could the common world recognize and distinguish the animal races? how could Owen make his discovery without the help of such a principle? Owen has developed a teleology of a higher and more archetypal order than Cuvier,